

WHAT IS CLAIMED IS:

1. A method of mapping a topology of a spare capacity of a distributed restoration algorithm (DRA) provisioned telecommunications network having a plurality of nodes interconnected with working and spare links, the method comprising:

outputting a message from each spare link of each of the nodes to the adjacent node to which the spare link is connected;

identifying the port number of the node from where the spare link outputs the message and the port number of the adjacent node connected to the spare link whereat the message is received;

storing as data the respective port numbers of the nodes that have connected thereto at least one spare link via which the message is either sent or received, the identifies of the nodes and the spare links interconnecting the nodes; and

generating from the stored data the topology of spare links interconnecting the nodes of the network.

2. The method of claim 1, further comprising:

storing the data in a central processing means; and

providing the generated topology of the spare links of the network to an origin node for beginning the restoration process if a failure occurs in the network.

3. The method of claim 2, further comprising:

continuously updating the status of the message arriving at each spare port of the nodes of the network; and

storing the updated status in a central processing means, wherein the central processing means uses the updated status to provide a real time topology of the spare capacity of the network.

1 4. The method of claim 1, wherein when a failure occurs in the network, further comprising
2 the step of transmitting from a custodial nodes of the failed link a message, via a functional spare
3 link, to downstream nodes thereof to inform downstream nodes that it is a custodial node.

1 5. The method of claim 1, further comprising:
2 selecting a custodial node of a failed link to be an origin node; and
3 the origin node utilizing the topology of the spare capacity of the network to find an
4 alternate route for the disrupted traffic.

1 6. In a distributed restoration algorithm (DRA) provisioned telecommunications network
2 having a plurality of nodes interconnected with working and spare links, a message being
3 transmitted between adjacent nodes of the network that are connected by at least one spare link
4 for mapping the topology of the spare capacity of the network, comprising:

5 a first field containing the identification number of the node that sent the message;
6 a second field containing the identification number of the port of the node whence the
7 message is output; and
8 a third field having an identifier that is set to a specific value when the node is a custodial
9 nodes that bracket a failed link, wherein the message is broadcast from one of the custodial
10 nodes that bracket a failed link.

11 7. The message of claim 6, further comprising:
12 a fourth field for identifying the message to be a message that is continuously transmitted
13 and exchanged along spare links between adjacent nodes of the network while a DRA process is
14 not in progress.

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